EDUCATIONAL RESOURCES AND TECHNIQUES

WINTER
1961

THE OFFICIAL
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JOURNAL

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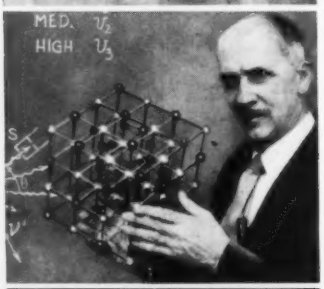

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EDUCATIONAL RESOURCES and TECHNIQUES

The Official Journal of

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CONTENTS

ARTICLES

2 **TEACHING MACHINES**
A Technological Approach to The Teaching-Learning Process
BEN F. HOLLAND

4 **TO BRING THE WORLD TO THE CHILD**
Brazosport's Concept of The Instructional Resource Center
B. I. BOYETT

6 **THE SMOKE IS CLEARING**
The Emerging Role of The School Librarian
TRAVIS E. TYER

8 **THE ELEMENTARY SCIENCE FAIR**
Houston Promotes Elementary Science and Math
MRS. KATE BELL

10 **TAPE RECORDING AIDS THE SLOW-LEARNING READER**
Sweetwater Uses an A-V Approach to an Old Problem
ROGER EATON

REGULAR FEATURES

15 LEGISLATIVE REPORT
16 THE PREXY'S CORNER
17 TEXAVED BUSINESS DIRECTORY
18 TEXAVED NEWS
20 EDITORIAL

TEACHING MACHINES

A Technological Approach to The Teaching-Learning Process

BEN F. HOLLAND

Dr. Holland is Associate Professor of Educational Psychology at The University of Texas. He is a member of the Graduate Faculty and director of the audio-visual program for the College of Education.

In addition Dr. Holland has found time to author various articles on audio-visual education.

On March 3, 1960, he was awarded a certificate for meritorious service and outstanding contributions to the field of audio-visual education and to DAVI.

The technological applications to the teaching-learning processes are being approached from two directions: from the standpoint of mass education, and from that of individualized instruction. The hardware selections for the two approaches appear to be television and the teaching machine. As a result, both television and teaching machines are receiving considerable attention from researchers and educators. Although both types of media have been with us for a number of years, their impact on education was negligible until recent years.

DEVELOPMENT OF INTEREST IN TEACHING MACHINES

Although it might be interesting to trace the development of technological aspects of education by reviewing the applications of mass media to the teaching-learning process, our concern here is the development of interest in teaching machines. The first form of a teaching machine was a testing device invented by Sidney L. Pressey in 1926. Subsequently, Pressey and his students developed a number of articles outlining their experiments. By 1932, Pressey abandoned this field of experiment after lamenting on the then prevailing lack of interest in labor saving teaching devices.

In the years prior to 1958, scant attention was paid to the subject of teaching machines by writers in the field of educational research. According to an article by Fry, Bryan, and Rigney, in the first supplement to *Audio-Visual Communication Review*, the subject of teaching machines not only received scant attention, but when it did occur, the discussions consisted mainly of theory. A small number of articles have dealt with the subject in a developmental and descriptive way, with others dwelling on the problems of programming. The smallest representation in the literature has been in the area of field studies.

Since 1958, interest has quickened with more literature and a greater variety of reporting.

The expanding interest in teaching machines has also been manifested by the numerous conferences on the subject that have been held at various places during the last two years, including one at the University of Texas in the summer of 1960. A concensus of opinion among those attending the conferences and working with the media has been that teaching machines will be used extensively in our schools and colleges.

COMMERCIAL CONCERNS EXPRESS INTEREST

Interest among educators has prompted commercial concerns to take a look at the potential market for programs and machines. According to an article in the October, 1960 issue of *Fortune* written by G. A. W. Boehm, more than a hundred new programs are now being written. The great majority of these experiments are being carried on in colleges and universities, although about a dozen commercial concerns are engaged in teaching machine development. Most of the research into programming is being undertaken with financing provided by the Ford Foundation and the U. S. Office of Education.

Among the companies that are featuring experimental models of teaching machines are Dyna Slide Company, Foringer and Company, Instrument Research Company, Rheem-Califone, Teaching Machines Incorporated and Western Design.

FUNCTIONS AND CHARACTERISTICS OF TEACHING MACHINES

When one first hears about teaching machines, it is natural to wonder about what they do and how they work. Actually a teaching machine may not be a machine at all, but a scrambled book or punch board. On the other hand, it may be a complicated electronic or mechanical device. In either case, a teaching machine is a device for presenting a program or series of items of curriculum materials or subjects to a learner in such a manner that he may respond to each by activating the machine and choosing, writing or punching an answer to a question. What the program and machine do is referred to as *programmed teaching;* what the learner does in acquiring material presented, is referred to as *programmed learning.* Thus, programmed teaching is a method in which a device and a program perform the role of stimulating and directing a learner toward mastery of a skill or a body of information. Programmed learning, moreover, is the process of activity by which an individual successfully reacts to the items in a program, without direct personal assistance or supervision. Programming is the work and thought of the person who prepares a program for a teaching machine.

PRESSEY'S APPROACH

The first form of teaching machine was Pressey's early testing device by which a student could test himself by reacting to a series of multiple-choice items. In reacting to each item, the student read a statement and a question on it having four or five possible answers only one of which was correct. He then chose the answer and pressed a button corresponding to his choice of an answer. If the answer was correct, the machine recorded his response and exposed the next item; if the answer was incorrect, the student chose another, and so on. At the end of the series, the student had a record of both correct and incorrect responses.

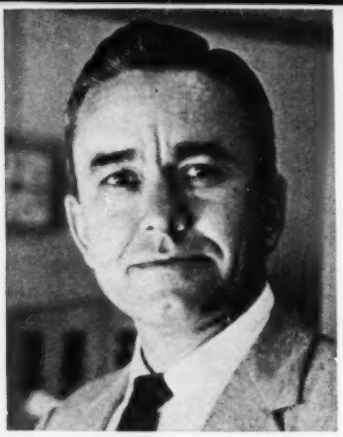
In 1927, Pressey introduced a modification of his earlier device. This model required the student to respond to each item that he missed at least twice, when it was automatically eliminated from the series. Hence, each student continued to work on the series until all of the items were answered correctly at least twice, and the machine issued a coupon indicating complete mastery. In this model, there was a close approach to the current concept of a teaching machine.

The automatic control of a student's reactions to multiple-choice questions and immediate corrections of incorrect responses is a feature of a number of current teaching machines and programs, such as Crowder's scrambled books and the Auto tutor. In the scrambled book, the students are given material to be learned in relatively small logical units and tested immediately on each unit by a multiple-choice question. If the student's choice is correct, he is instructed to proceed to the next unit. If he chooses an incorrect answer, he is instructed to turn to a given page number corresponding to his answer, where the nature of his error is explained and he is instructed to return to the original page and question for the review of the unit and question and another choice. Thus, for each incorrect response, there is a separate page of correctional material that the student examines before going on to the new unit. The inclusion of such material in a program is

(*continued on page* 12)

"To Bring the World To the Child"

B. I. BOYETT



B. I. "Mac" Boyett is Supervisor of The Division of Instructional Resources of the Brazosport Public Schools in Freeport. A pioneer in the concept of the instructional resource center, Mr. Boyett has also been active in Texas audio-visual circles for a number of years. He is currently President Elect of TEXAVED.

— An idea as old as education — but an idea that was brought to practical fruition in Brazosport by three teachers who, though teaching in widely divergent fields, had a common dream and worked to bring it to realization.

During the fall of 1953, Mildred Abshier, fourth grade teacher, John Dunn, art teacher and the author, a science teacher, combined their personal and classroom resource materials and efforts to further the belief that if *one picture is worth ten thousand words, then one good example is worth a hundred explanations.* Helped by their Principal, John Rathke, they set up in a vacant classroom of the Velasco Junior High School a Science and Nature Museum. Mr. Dunn and the author prepared exhibits and gave demonstrations to other classes during their planning periods and lunch hours.

Recognizing the possibilities of a complete learning resource center for the entire Brazosport School District, Superintendent Terrell W. Ogg and the Board of Education began, in the fall of 1954, a program to coordinate the many resources and instructional materials found not only in our schools, but throughout the entire community as well.

The 1955 school year saw a separate Division of Instructional Resources for the district established and a Resource Center set up in the old kindergarten building on the Velasco campus. Responsibility for the library program throughout the district, the audio-visual department, the professional library and textbooks was added to that of the Educational Museum and Resource Center.

Resource Center Secretary, Mrs. Ida Faye Ford, foreground, and Mrs. Dorothy Moore, Instructional Materials Clerk, handle film orders and the distribution of objective materials.

Library coordination is in the hands of the Library Consultant, Mrs. Nan McCall on the left. In the center is Mrs. Valerie Jones, Library Clerk, who works with central library cataloging. On the right is W. L. Stuart, Instructional Materials Consultant who bears the responsibility for the Professional Library and Textbook Services.

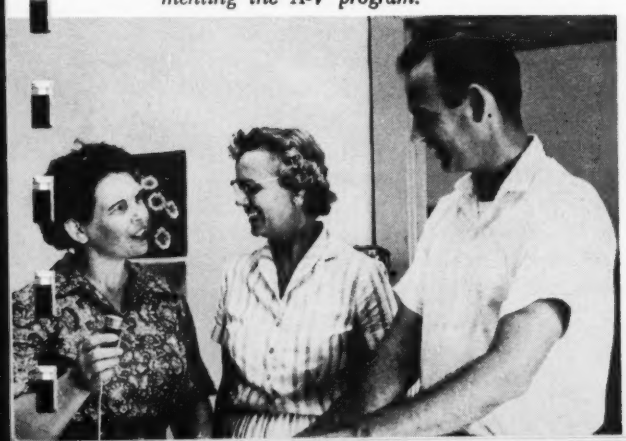
The author was made co-ordinator of the program on a half time basis.

Here, a teacher or administrator could obtain, from one central source, all types of resource materials ranging from professional books to objects of science and history. Today the division includes seven full time people and is responsible for the following services of the Brazosport Independent School District:

Instructional Materials
Audio-Visual Education
Professional Library
Community Resources
Museum Coordination
School Libraries
Public Relations
Textbooks

The staff of the Division of Instructional Resources works with classroom teachers, principals, supervisors, curriculum committees, the Superintendent and the entire community to see that every effort is made to have available to our teachers and students all the helps needed to make the job of educating our boys and girls a more effective as well as a more satisfying one.

Audio-Visual Consultant, John W. Dunn, right, works with teachers and school Instructional Materials Coordinators in implementing the A-V program.



Although instructional materials should always be accessible, it is neither possible nor practical for any one teacher to amass and catalog, or keep readily available, all the materials and resources necessary to the modern classroom. In Braszosport we feel that the libraries are the logical places to which our teachers turn for help in discovering, obtaining and using instructional materials and resources, as well as any equipment essential to the use of these materials.

We are convinced that the only effective as well as the most practical and economical method of coordinating instructional materials in the individual school is through a full time co-ordinator. Since we have a full-time librarian in every school unit in our district, we have trained them to serve as coordinators for all teaching materials, whether printed, visual or audio.

The housing and distribution of all instructional material or equipment for the individual school not actually kept in the classroom is the responsibilty of these library coordinators. They are also responsible for ordering, distributing and returning all material loaned to the teachers in their school by our district Resource Center.

Although we agree that most instructional services should be provided in the individual school, our experience has shown that, when the individual school cannot satisfy all needs, a central resource center serving the entire district is the most satisfactory answer. It provides all schools in our area with a far wider range of instructional materials and services than can be afforded by any one school and makes possible more efficient and economical programs of improved utilization of instructional

(*continued on page* 14)

The Smoke is Clearing

A Discussion of the Emerging Role of the Librarian As New Instructional Media Bring Changes to Education

TRAVIS E. TYER

Many librarians — public, college, university and school — have fought the concept of the library as an instructional materials center since its inception. School librarians seem to be the last to put away their guns, but with the advent of the new national standards published last spring by the American Association of School Librarians, the smoke is clearing.

In theory the librarians agreed that the concept was valid. Their arguments always centered in one thought: "Since we do not have the staff, quarters, finances or equipment to carry out an adequate program with printed materials, why ask for more work?" The statement issued by the American Association of School Librarians in their publication, *Standards for School Library Programs*, does advocate an equalization of these four factors with specific recommendations to provide a good instructional materials center. At the same time, it advocates that some schools who are seeking excellent programs will want to go further; indeed, some already have.

As the development of newer media of instruction began its gigantic surge following World War II, school librarians were extremely busy expanding services for printed materials. There was so much work to be done and additional staff was not being provided. Thus they said, "A-V materials do not belong. Let someone else look after that." This is the place where librarians rationalized themselves into error. If a teacher has all her teaching materials in her classroom she is apt to use them more. The theory for the self-contained classroom is good but impossible to finance. The next best thing is a centralized collection. If a teacher has to go to one center for audio-visual materials and another for printed materials, she will probably omit one of them. It is difficult for her to select the materials to best do a particular job unless she can lay them side by side and study them in light of her teaching objective.

Audio-Visual specialists who have not made a thorough study of the new *Standards* may be alarmed with my statements up to this point. There is no cause for alarm. These standards were developed with the active participation and support of twenty professional organizations other than school librarians. These are no fantastic dreams of the recluse shrouded in her ivy covered towers with surrounding moat. They are the standards which a segment of American educators feel are imperative for a first rate school curriculum.

Travis E. Tyer, Librarian for the Senior High School at Seminole, Texas, is Chairman of the School Division of the Texas Library Association and the Library section of the Texas State Teachers Association. He is also serving as the state sponsor for the Teen Age Library Association of Texas. On the home scene he is President of the Seminole Classroom Teachers Association.

The Department of Audio-Visual Instruction was represented by Dr. Paul Witt, Professor of Education, Teachers College, Columbia University. Other educators were consulted beside the committee and those included E. Ben Evans of Bakersfield, California, Dr. Anna L. Heyer of the DAVI office and Dr. Charles F. Schuller of Michigan State University.

The *Standards* recognize three established patterns of organization for the provision of instructional resources in the classroom. Probably the most common pattern of organization is that of dual responsibility. This dual responsibility is sometimes divided between the librarian and an audio-visual specialist; sometimes between the librarian and an administrator; sometimes between the librarian and a classroom teacher. In any given school district, the degree of responsibility may vary with either the librarian or the other party assuming more of the leadership. In each case, definite lines of authority and responsibility should be stated and assigned for maximum effectiveness in the all important job of providing a well-balanced supply of materials for the education of our youth.

The second pattern of organization is where the library department and the audio-visual department are two complete entities within the same school district. Even in this pattern of organization there should be a closeness in the relationship between the two since they both are working for the same purpose — to provide a variety of teaching materials for the curricular needs of the school system.

The third pattern of organization is where the library has the primary responsibility of providing the materials needed to effectively teach boys and girls. If there is adequate provision for staff, finances, equipment and quarters this is a very economical and effective plan of organization.

As you can readily see, the three patterns mentioned are in practice within a few miles of you this very year. The overall objective in each case is the same. It would then merely be a matter of each school district's deciding which pattern of responsibility is the most feasible and economical with the local conditions that exist. There are many determining factors to be considered: the size of the school district, the size of the faculty, the number of campuses, the size of the student population, the distribution of the school population are a few.

Now that librarians have officially accepted their responsibility in working with the newer media of instruction, an instructional program must be carried on among the librarians themselves. Audio-Visual specialists will have to assume a role in teaching librarians the use of the newer media for maximum effectiveness. They will have two major problems. One will be to overcome the feeling that the various instructional materials are in basic competition. Since most librarians are women, the other will be to overcome their fear of machines or anything slightly mechanized. As all fears, this can be overcome by knowledge. In reality, these two hurdles are the same as those the audio-visualist combats in his work with teachers. The second hurdle is identical. The first is different only in that many teachers feel all instructional resources are in competition with the textbook. This is an obstacle which can be hurdled once the teacher consents to allow the use of other materials. The results will prove the fallacy of the teacher's argument. In like manner, the librarian will accept the newer media in its proper perspective when the results have proven their value.

Yes, the smoke is clearing, and audio-visualists and librarians are joining hands tighter than ever before. This is a MUST if we are to successfully supply the instructional resources that our teachers should have to meet the challenge of the American schools today. We must realize that there is no basic competition among instructional materials. We must be leaders and attract into the materials field the very best organizers who work well with people, both individually and in groups. We must constantly evaluate newer media for their value in teaching. Regardless of our title, audio-visualist or librarian, we must work cheek-to-cheek to do the job ahead: TO PROVIDE A MULTITUDE OF INSTRUCTIONAL MATERIALS AND OTHER RESOURCES FOR TEACHING AND LEARNING.

Television presentations played an important part in the overall planning.

THE ELEMENTARY SCIENCE FAIR

Houston Fair Encourages Interest and Participation in Science and Arithmetic

MRS. KATE BELL

The Elementary Science Fair of the Houston Public Schools held March 18, 19, and 20, 1960 at Sam Houston Coliseum was the culmination of emphases placed on the improvement of science teaching and learning during the school year 1959-1960.

The purpose of the fair was to encourage interest and participation in science and arithmetic by providing an opportunity for boys and girls to display their exhibit materials and to be properly recognized for their achievement.

Detailed planning and implementation of the fair was accomplished through committees of supervisors, principals, and teachers set up for each grade level, plus an additional committee for special education classes working with Dr. Charles R. Nelson, Mrs. Kate Bell, and Mrs. Ruby Travis of the Elementary Office.

Entries from 1200 classrooms in 92 schools were exhibited on card tables furnished by the exhibitors. Bulletin boards were also furnished by exhibitors. The exhibits ranged from explanatory charts and mobile displays to actual working models of various kinds of simple machines to experiments performed in classrooms.

A Certificate of Participation was awarded an individual or class who submitted a display.

TELEVISION PLAYS AN IMPORTANT PART

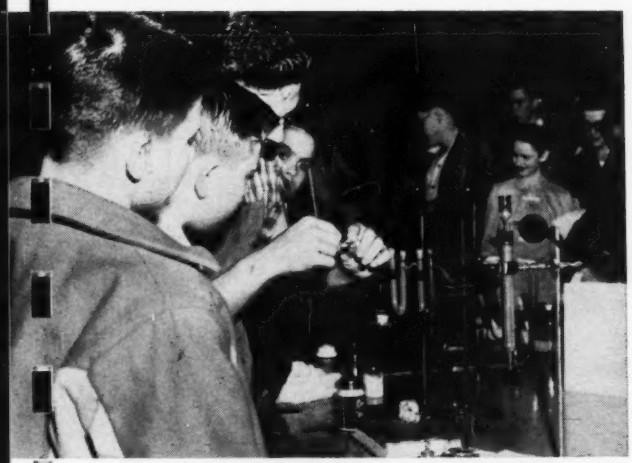
In order to create an interest in the Fair, a telethon was conducted at the coliseum from 10:00 a.m. to 2:30 p.m. on March 18. Exhibitors were interviewed as they entered the coliseum. Certain exhibits had been prearranged for interview. As they viewed the

Mrs. Bell has taught and has served as an elementary principal. For the past fourteen years she has acted as Assistant Director of Elementary Education of the Houston Public Schools. Science is one of her chief interests. She was a member of the Texas Commission on Science; is co-author of a series of science textbooks; and is a panelist for the National Science Foundation.

telecast, pupils and parents throughout the district were stimulated to visit the fair.

The series of activities directed toward the improvement of science teaching and learning began in September with the visit of Dr. Herman Schneider, author of the science textbooks currently adopted in the Houston schools. Dr. Schneider was presented to all elementary teaching personnel on a telecast in which the philosophy and plan of the series were presented.

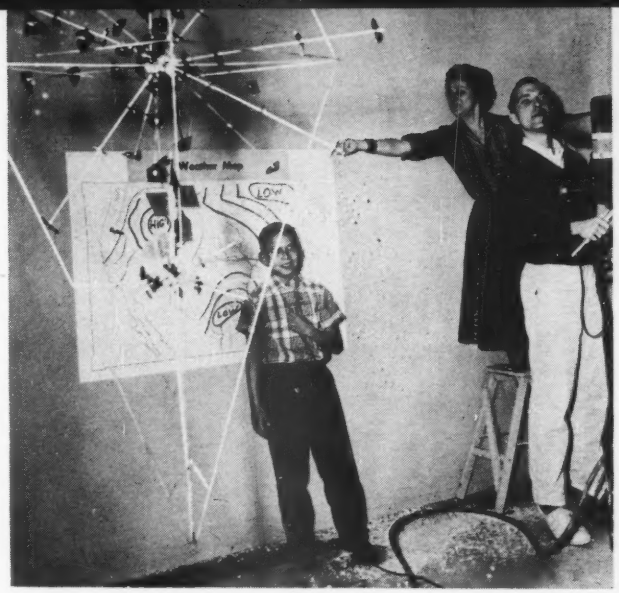
Professional growth courses in science for K-6 teachers designed for the acquisition of scientific information and methods of communicating it to pupils were conducted by Dr. William Yost of the University of Houston. Courses in arithmetic for K-6 teachers were conducted by Dr. Joyce Benbrook of the University of Houston. Hundreds of teachers completed these courses.



Demonstrations by participants created interest among many fair visitors.

A study was conducted on the use and arrangements of display and bulletin boards. A wide variety of free-standing, light-weight, inexpensive bulletin boards were improvised. Peg boards, wire screens, linoleum, wood, burlap, bamboo blinds, poster boards, corrugated cardboard were among the materials used in the making of bulletin boards. getters, fastening materials.

"Meet Me At The Fair" was a television series on consecutive Tuesdays beginning February 23 through March 15 over the facilities of KUHT, Channel 8. The series was designed as in-school experiences for pupils and teachers to stimulate interest and participation in the fair, to show techniques of scientific thinking, and to provide in-service experiences for teachers.



Pre-arranged interviews by television helped stimulate visitation by parents and the general public.

EVALUATION

An evaluation of the exhibits at the fair revealed that the activities directed toward the improvement of science in the elementary schools had been most effective in improving Materials were organized for display in terms of design principles, such as: theme, center of interest, arrangement, use of color, appropriate heading, sub-titles, margins, attention- the quality of teaching and of learning. Evidences of improvement were manifest in topics selected for study, in depth of learning revealed by exhibits, in artistic display of materials.

Proper arrangement made many exhibits self explanatory.

A group of students from Miss Debbie Blagg's fifth grade class at John R. Lewis Elementary School use the tape recorder during reading drills on the third grade level.

THE TAPE RECORDER AIDS THE SLOW-LEARNING READER

ROGER EATON

For many years Mr. Eaton served as a principal in Cowen Elementary School in Sweetwater. Since 1955 he has been Elementary Supervisor and Director of Audio-Visual Education for the Sweetwater Public Schools. Mr. Eaton has been active in many professional groups and is a former Director of TEXAVED.

Using the tape recorder to teach reading may seem out of orbit to some of our teachers, but is it? If it can be used effectively for teaching a foreign language in the lower grades, why not the English language? Many of our children seem to miss the letter sounds as they progress through school. One teacher said, "Some words that we were teaching the Spanish-speaking children were not being pronounced correctly. We discovered the incorrectness when replaying tapes these children had recorded." The tape recorder makes teachers and children aware of these mistakes and leads to better linguistic practices. In our school system, we are using the tape recorder effectively in reading classes with children who are sometimes classified as "slow learners" or "retarded readers."

Use of the tape recorder in the reading program was begun in two different classroom situations during the last semester of the past school year (1959-60). At the present time it is being used in three different schools.

The first of these experimental situations was with a group of twenty children, for one hour a day, in a controlled reading situation.

The main purpose was to see if the use of the tape recorder would aid retarded readers in comprehension and enlarge pupil vocabulary. These children were in grades four, five and six. They ranged in age from nine to fourteen years. It would seem that the older children would lose interest after the "new" had worn off the use of the machine, but it had the opposite effect. They did not mind the level of reading (second grade, level two), when working with the recorder, and a high interest level was maintained throughout the semester.

Seven of the children were of Spanish-speaking heritage, thirteen were Anglo. I.Q. testing of these children revealed that six of the children had an IQ of below 60; seven ranged from 70-80, and seven 80-94.

Another group, composed solely of Spanish-speaking children, was started at the second-grade level on this program.

One item of particular interest among the two groups was the fact that no speech defects were noted in any of the participants.

A recognized test was given the first group of twenty children to ascertain their reading level. The group level was found to be second grade, level two. Since our school has adopted the Scott, Foresman & Co. Reading Program, we began these children in the basal reader *More Friends & Neighbors.*

The procedure for using the tape recorder in this situation is very simple, being composed of the following five steps. The teacher first introduces new words in vocabulary with the class, and, where applicable, visual materials are used. The second step was to play a pre-recorded tape, recorded "at as near the reading speed of the children as possible", while they read silently with the tape. As this step progresses the teacher can make a mental note of the children who are not following as directed. After a few weeks recordings of the story can be done in the classrooms and give the children another opportunity to hear the vocabulary. Step three: have the group read the story in unison with or without, the recorder. If any word difficulty appears at this point, stop and explain the words to the children. Step four: have each child read a portion or all of the story into the tape recorder. After each has recorded his part of the story, replay the tape to the group. Following this recording and replay, discuss the story with the children using the teacher manual of your reading series. This helps to develop structure and phonetic skills.

This procedure was followed for about six weeks, and no more than two stories a day

Spanish speaking students in Mrs. Edna Boyd's second grade at Emilio Carrenza Elementary School use the tape recorder and the controlled reader in English instruction. The controlled reader is used strictly with vocabulary strips at the first of the years instruction.

were used. (Remember, these were fourth fifth and sixth grade children.) For lower grades one story a day would seem sufficent. For another month the group listened to recorded stories, the purpose being to discipline them for listening purposes and building vocabulary. The story was heard four times.

As has been stated, a reading test was given these children at the inception of this program and again at the end of school. Results were very good. As an example, Paul C., a Latin American child with a bad home environment, had given considerable trouble to his teachers as he progressed through the first three grades, and when he reached the fourth grade he was almost at the stage of delinquency. His IQ was in the 80-90 group. In testing Paul after this program had been under way for eighteen weeks, he had advanced from second grade, level two, to fourth

(*continued on page* 13)

Fourth, fifth and sixth grade students under the direction of Mrs. A. C. Bishop at the J. P. Cowen Elementary School use the tape recorder and controlled reader to increase reading efficiency.

TEACHING MACHINES

(*continued from page* 3)

called branching, and the process is referred to as intrinsic programming. The main feature of this type of teaching machine is the student's reaction to a multiple-response item rather than the machine's determination of what he will do next. The function of the machine is to indicate whether the answer is right or wrong, and to guide the student to the material that he needs to study after making an incorrect response.

SKINNER'S APPROACH

Another set of concepts regarding the nature of machine design and programming is that applied by B. F. Skinner. In this approach, a machine and its program should lead the learner to respond repeatedly and correctly to a series of related and relatively simple items by filling in blanks, with a word or two, or by making marks, until he conditions himself to absorbing the information. The items are so stated that the learner is led almost invariably to make the correct response to each, and is immediately informed that he has done so. The reward or reinforcement for making each correct response is self-satisfaction, which motivates the learner to keep on working until he completes the program. If a wrong response happens to be made because of faulty cueing or prompting, it should be corrected immediately so as to focus attention on the correct response. Thus, the function of a teaching machine, according to the Skinnerian concepts, is to present bits of information or other types of stimuli which will prompt the learner to make a correct response, and to provide a means of verifying the correctness of the response and of correcting wrong responses immediately.

SKINNER'S MACHINE

Skinner's disc machine, designed for students from junior high school to college, presents a series of items to be learned through a viewing slot, one item at a time. The student responds by writing his answer on a separate paper tape. After writing a word or other response, the student operates a lever that moves his answer under a glass plate and brings the correct answer into view for comparison. If the answer is right, the item will not be shown again; if it is wrong, it is shown again so the student can make a correct response. The student is asked to repeat thirty items until he makes a perfect score.

OTHER MACHINES BASED UPON SKINNER'S PRINCIPLES

Several other forms of teaching machines based on Skinner's concepts of program and machine design have been constructed. One is the Didak manufactured by Rheem-Califone. For this machine, a program is printed on a wide-reel of paper and displayed one item at a time through a window at the text. The student writes his answers on a separate reel of paper that is exposed in a narrower window at the right. By pulling a knob, the student brings into view the correct answer and proceeds to the next item. He marks each answer right or wrong by pushing a pencil into one of two holes to the right of the answer window. After recording his responses, the student pushes a pencil into a third hole and unlocks the machine for exposing the next item.

PROGRAMMING

Programming, as indicated previously, is the preparation of materials for use with teaching materials. Obviously, programming is the most essential aspect of automated teaching and learning.

The general form of a program, as has been indicated already, depends upon the nature and design of the machine for which it is made. But there are other more basic considerations to be taken into account in programming other than machine design; for should a suitable program for self-instruction be constructed, a machine could probably be made to handle it automatically.

One approach to programming is that of selecting content to be learned by machine from a course of instruction or textbooks, and working up items in either of the various forms suggested. This approach would imply the acceptance of the objectives and content of a course, and the selection of items that could be programmed and learned by using a particular machine. In this case the items would appear to be the concepts and principles or skills with appropriate modes of response indicated for each. In other words, the programs should be based on an adequate statement of the prime objectives, the kinds of responses to the stimuli, and the proficiences required in some degree of quality, quantity or time. The precise behavior or responses should be adequate for mastery.

Roe and Moon suggest, however, that courses of instruction are artificial boundaries for transmitting knowledge, and completely

(*continued on page* 19)

TAPE RECORDER

(*continued from page* 11)

grade in reading ability. He now had a desire to learn, as was evidenced in his other school work. Achievement testing indicated that he was learning from 65 to 70 percent of his work. Teacher evaluation of the child (third-year report card) indicated he was about on the level of a second grader at the beginning of school. At the close of school he had progressed to fourth grade, level one.

Prior to the beginning of this program these children could not comprehend the meaning of a word even though they could recognize it in reading. After only six weeks of tape recorder practice, it was noted that the children could more easily recognize, with understanding, new vocabulary.

This use of the tape recorder on a sustained and practical basis gives the children opportunity to hear themselves and improve their enunciation and pronunciation of words. They hear themselves as others hear them. It became quite a game to see who would read first and have it recorded, which is a very important part of this method of teaching.

Other results indicated more reading speed, more expression in reading, correct observation of punctuation marks, and creation of more natural expression. All these factors contributed to better understanding and motivated the child to increased reading interest.

An evaluation of the twenty children in this particular experiment shows that seven were able to meet their next level of work. The other thirteen, because of extremely low IQ's, will be only slow to medium students. However, it is felt that they will have a better understanding of what they are able to read than they did before experiencing this program.

The Spanish-speaking second graders? A significant gain in reading level was noted after using the tape recorder with these children. It also helped the child to get away from the translation process, and the tape recorder aided these children in overcoming timidity and is encouraging them to express themselves orally.

On the whole, they are progressing at a better rate of reading speed than has been shown with these children in the past.

Research is continuing on this type of program in our schools. Some experimentation has been given to using the tape recorder in conjunction with the controlled reader. It is quite possible that this will prove valuable in teaching the slow-reading children.

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"WORLD TO THE CHILD"

(*continued from page 5*)

materials. Daily mail service from our Instructional Resource Center to every school in our district assures fast service on orders.

Our philosophy is to house in each classroom those inexpensive, often used materials needed for a better learning situation, and in the school library - resource center those materials not as often used as well as equipment for utilizing them such as tape recorders, film, filmstrip and slide projectors, opaque and overhead projectors, large screens, extra record players along with certain maps and charts not needed constantly in the classroom.

Those items that are only occasionally needed or that are too expensive for purchase by one school are housed in our district Instructional Resource Center. Here also is located the Professional Library, the district textbook depository, the processing center for all libraries, the filmstrip library of more than six thousand filmstrips, the Educational Museum, the unit files of seven hundred odd packets of unit picture material, the district graphic productions laboratory, as well as offices of the supervisor of the Division of Instructinal Resources, the audio-visual consultant, the library consultant and the textbook-professional library consultant. A secretary, a materials clerk, and a library clerk complete the staff of the center.

Not only services, materials and equipment, but also instruction in the proper use of this material and equipment is provided by our division. In-service sessions with teachers in their own school units as well as workshops in the Center itself are held on such subjects as teaching with tapes, preparing bulletin boards for teaching, demonstrating elementary science, etc.

I have explained how our own Resource Center grew from a simple beginning to the real service center it is now only as an example. There are many ways for such a center to develop. We believe any district, large or small, can afford a resource center. The size of the installation, size of staff and cost of operating will vary according to the amount of material and services rendered and the size of your budget. A small center in your high school library can serve your district of twenty teachers just as well as a separate Resource Center serves almost four hundred educators of our district.

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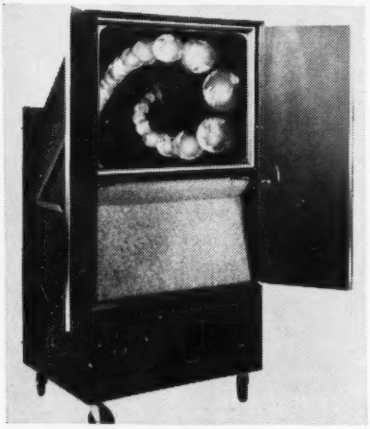

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LEGISLATIVE REPORT

B. I. BOYETT

The curtain has gone up. We are fortunate that our "star" heads the "cast"!

Turman is now Speaker of the House. We believe that in him we have a real ally for good schools in Texas. We who worked hard to help him gain this coveted position, must work even harder to see that he and the other so-called "liberals" have the opportunity to show the people of Texas that they care more for the minds of our children than they fear the horrors of another tax raise.

Some "conservative" members of the legislature will probably go down the line for the school bills but against any tax money to pay for them.

In Brazoria County our local Representative, Neil Caldwell and Senator A. R. Swartz have both committed themselves publicly to support wholeheartedly the entire group of "school bills". But they have expressed concern that I am sure is felt by other legislators. When they support such bills honestly, they must then vote funds to see that they are carried out. We must not tell them one moment to give us these much needed things for our schools, and in the next breath say, "But don't raise taxes!" The money must come from somewhere so we must support our legislators when they tax us.

It is now up to *each* of us and other school people to "sell" every friend and acquaintance on the vital need for specific action now to improve Texas schools by making it possible to enlist and keep more good teachers and administrators. It's not just a "salary raise for teachers" but the need to get and keep the best people in education that we must fight for.

Our "film bill" became Senate Bill 47 (sponsored by Senator Andy Rogers) and was referred to the Finance Committee. It was sponsored by Representative Ronald Roberts and forty co-sponsors in the House and became H. B. 65. Have your people contact the appropriate committee members and their legislators at once on these two bills.

THE PREXY'S CORNER

JIM HARDIE

Texaved
President

An Image of Texaved

Advertising men often speak of *the public image.* This term refers to the *idea, understanding,* or way the general public *sees* and *feels* toward a product, personality or organization. It carries with it the matter of identification.

What is the public image of TEXAVED? What picture or association comes to the mind of an educator in Texas when he hears this name?

An educator friend recently said to me, "TEXAVED seems to be in a state of transition. You no longer speak only of films, filmstrips or which manufacturer makes the best projector. You now seem to be greatly concerned with curriculum development, implementation and educational philosophy."

My friend's image of TEXAVED is changing. This is as it should be, for TEXAVED has been undergoing continual change since its birth just eight years ago. We now find ourselves in the center of the most dramatic developments ever to affect public education.

Most audio-visual programs in the state started as film libraries. Additional demands for services brought the development of full scale audio-visual programs. Now a new dimension in services called the *resource center* is coming into being. Such centers provide a broader scope of services to implement the *new look* in curriculum design.

Tremendous pressures are being applied to educators to find new approaches for solving the problems of: (1) overcrowded schools; (2) the increased preparation of students required for this technological age; and (3) the shortage of teachers. As a result, we see a great deal of experimentation taking place. Educational television, teaching machines and programmed learning, language laboratory facilities, and the development of packaged resource units, are all aimed at providing a new breadth of resources for the teacher to plan learning experiencs in depth.

TEXAVED is vitally concerned with all of these developments. It exists primarily for th purpose of helping to prepare its members for informed leadership which is urgently needed in our state to cope with these developing trends. Such leadership is needed at all levels of educational endeavor.

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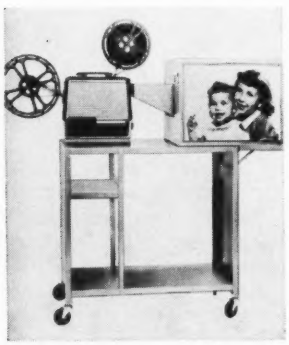

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TEXAVED NEWS

Membership Mushrooms

According to Dr. James Roberson, TEXAVED treasurer, the membership in the organization has now jumped to 575. This is the largest number ever to belong to this organization. It is still short of our desired goal of 1000 members for the year, but considering the fact that our membership drive has been underway only two months, this shows a healthy sign of interest and growth. TEXAVED's new Journal is directly responsible for much of the growth now being experienced. Normally, during the past eight years, TEXAVED's membership has averaged between 90 and 160 members. With the stepped up interest in newer instructional media, TEXAVED must fulfill a greater leadership role in education in the State. *EDUCATIONAL RESOURCES AND TECHNIQUES* will play a great part in helping TEXAVED fulfill its new role.

1960-61 Budget Presents Problems

At the January Executive Board meeting members were plagued with budget troubles. For once the troubles could be classified as happy ones. The rapid growth of the organization and the extensive activities promoted by its new publication *Educational Resources and Techniques* have given our budget planners a few headaches. At this point it is difficult to determine the expected receipts of the year due to the highly successful membership drive now underway.

With this in mind the Board authorized President Jim Hardie, Treasurer Dr. James Roberson, Membership Chairman Bill Harville, and Executive Secretary Dr. Ernest Tiemann to work out a flexible arrangement based upon percentages of our total income rather than fixed amounts. Lets hope that happy troubles of this nature continue to trouble us.

Study To be Undertaken

The Executive Committee has approved a recommendation made by B. I. Boyett and seconded by Dr. Ernest Tiemann that details of incorporation of our organization be thoroughly studied and if found feasible action to incorporate be taken immediately.

The board also authorized the expenditure of the necessary fees to carry out the incorporation proceedings.

Spring Conference Planning Underway

Dr. Wendell Williams, Educational Consultant for the State Department of Health, has been named as Chairman of the Spring Conference Planning Committee. Other members of the committee will be announced later. An outstanding leadership conference centered around issues of the newer frontiers in education is in the planning stages. The Spring Conference will be held in Austin May 12 and 13.

Improved Relations Texaved Goal

During the January Executive Board meeting it was suggested that TEXAVED offer leaders of other professional organizations an opportunity to submit articles to *Educational Resources and Techniques*. Dr. Tiemann suggested that it would be appropriate to have a guest article appear in each issue representing a major professional organization in Texas.

Other suggestions recommended that TEXAVED ask leaders of other professional organizations to be platform guests at our Spring and Fall conferences with the hope that they will reciprocate.

A third suggestion was offered that would allow the President of TEXAVED to write the program chairmen of other organizations and offer TEXAVED's services if needed during their respective conventions and meetings.

Galveston to Be Site of 1961 Fall Conference

Galveston has been named the site of the 1961 Fall TEXAVED Conference. The Executive Committee made the decision at the January Committee meeting. The excellent convention accomodations offered by the island city should provide TEXAVED with an appropriate atmosphere for the meeting which is tentatively scheduled to be held October 15, 16, and 17.

The motion offered by Bill Harville and seconded by Virginia Patterson, also named the Jack Tar Hotel as the site for the Convention Headquarters.

The decision to use the ultra modern Jack Tar facilities was prompted by the fact that the smaller more intimate surroundings could best be adapted to conventions of the size represented by TEXAVED's Fall Meeting.

Subscription to This Publication is Included In All Texaved Memberships

At the fall meeting of the TEXAVED Board of Directors plans were approved that allow a subscription to EDUCATIONAL RESOURCES AND TECHNIQUES to be included in services rendered all TEXAVED Associate and Active members. This is done without adding to the regular cost of membership in the organization.

All new members of TEXAVED automatically receive a subscription to the journal as part of their membership. This action is part of a concerted effort to expand TEXAVED's membership through expanded services to our members.

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TEACHING MACHINES

(*continued from page* 12)

inadequate for recycling students who fail to master a substantial portion of the content of any course. It is important in programming, they say, to require a student to respond to each item and to master each sub-objective before proceeding to the next level. The use of sub-objectives provides opportunity to screen and recycle a student at any point without waiting until the end of the term to either pass or fail him.

Glaser says that programming is a means of overcoming the limitations and disadvantages of mass media instruction and reinstating some of the advantages of face-to-face student-teacher interaction. It involves the construction of sequences of instructional materials so as to increase the rate of acquisition and retention of information and skill and enhances the motivation of the student.

In order to construct such sequences, it is important to know what the student is expected to know. Thus, the first step is to set up objectives, and a second is to specify the kinds of stimulus materials that the student will react to in the course of his performance. These steps will involve defining the field, stating the laws, principles, and the like; and selecting illustrative materials sufficient to enable the students to master or arrive at a generalization. The salient feature of the process is that of making a reward immediately contingent upon a small unit of the learner's behavior, which we technically refer to as reinforcement. By differentially applying reinforcement or relatively minute behavioral changes, it is possible to progress from the initial behavior of the learner in small steps through the development of complex behavior.

In order to elicit a correct response to each item, the programmer resorts to prompting or formal hinting or cueing.

The result of the growth of the automated approach to learning indicates the technical problems involving the actual presentation of information are not nearly so demanding as the problems presented by the programming of information to be handled by the various technical devices.

However, experience indicates that as more attention is focused upon these problems, research will bring answers which will make available more practical and valuable teaching machines and programs for widespread use.

An Editorial:

Expanding Educational Technology Increases the Need for Enlightened Leadership

The past several years have seen a spectacular acceptance of audio-visual methods in instruction, which have long been advocated by forward looking educators throughout the state and nation.

We need look no further than our own organization and its recent rapid growth to find evidence of this acceptance.

The reasons for this trend might be attributed to several factors: the increased public interest in improved instruction and the role of education, in general, in the areas of national defense and the national purpose; expanded educational research of recent years; and the inevitable application of recent technological advances to the teaching-learning process. There are, undoubtedly, other important reasons, but these should suffice for the present.

With increased public awareness has also come the spotlight of publicity for some of the more spectacular developments which have captivated the public imagination.

Gratifying as the glamorization of these instructional tools is, it has brought with it certain complications; specifically, the danger of creating a public image of these media as panacea for the many complicated problems now confronting education, and the danger of over-simplification of the problems of application of these media in the minds of the general public.

The problem then, of educators in general, and instructional materials specialists in particular, is to turn the increased public awareness of the new technological innovations in education into the broadest possible support of the whole spectrum of instructional materials, in order that the resulting educational advances will rest on the most solid foundations possible.

To accomplish these ends, professional organizations, such as TEXAVED, will need to move ahead with increased vigor to expand their leadership roll in the whole broad area of public education.

John W. Dunn, Jr.

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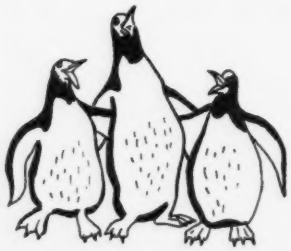

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